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CLAIMS:

1. An aeration/backwash device for use with a porous membrane filtration module including one or more membranes extending longitudinally between vertically spaced upper and lower headers into which the ends of the
5 membranes are potted, the membranes having a permeable wall which, in use, is subjected to a filtration operation wherein feed containing contaminant matter is applied to one side of the membrane wall and filtrate is withdrawn from the other side of the membrane wall, the aeration/backwash device adapted to at least partially surround a portion of said membrane module and including a
10 communication chamber having spaced through-openings in fluid communication with said chamber and the membrane module, wherein, in use, gas is supplied to the chamber and communicated to the membrane module through said through-openings to aerate the membranes within the membrane module and liquid backwash is withdrawn from and/or fed into the membrane
15 module through said through-openings into said chamber.
2. An aeration/backwash device according to claim 1 wherein the gas and liquid backwash are selectively communicated through the same through-openings.
3. An aeration/backwash device according to claim 1 or 2 wherein the
20 through-openings are vertically spaced through-openings in fluid communication with said chamber and the membrane module, and wherein, in use, gas is supplied to the chamber and communicated to the membrane module through at least the upper of said through-openings to aerate the membranes within the membrane module and liquid backwash is withdrawn from the membrane
25 module through the lower of said through-openings into said chamber.

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4. An aeration/backwash device according to claim 3 wherein backwash or feed liquid is fed or injected into the base of the module through the lower openings or both set of openings.
5. An aeration/backwash device according to claim 4 wherein the backwash
5 and/or feed liquid is used to sweep solids along the membranes to carry out solids backwashed off the membrane surfaces during said aeration.
8. An aeration/backwash device according to anyone of the preceding claims wherein the vertically spaced through-openings include an upper and lower set of through-openings.
- 10 9. An aeration/backwash device according to claim 8 wherein the upper openings are smaller in cross-sectional area than the lower openings.
10. An aeration/backwash device according to claim 8 or 9 wherein the openings of each set of through-openings are axially spaced around the periphery of the chamber.
- 15 11. An aeration/backwash device according to claim 8, 9 or 10 wherein the liquid backwash is withdrawn from and/or fed through both sets of through-openings.
12. An aeration/backwash device according to any one of the preceding claims wherein the device is formed as an annulus.
- 20 13. longitudinally between vertically spaced upper and lower headers into which the ends of the membranes are potted, the membranes having a permeable wall which, in use, is subjected to a filtration operation wherein feed containing contaminant matter is applied to one side of the membrane wall and filtrate is withdrawn from the other A porous membrane filtration module
25 including one or more membranes extending side of the membrane wall, the

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upper and lower headers being in fluid communication with one or both of the ends of said membranes and at least one associated upper and/or lower filtrate collection chamber such that, in use, filtrate withdrawn from said other side of the membrane wall is communicated through at least one of the upper and/or lower header to the associated upper and/or lower collection chambers, an aeration/backwash device at least partially surrounding a portion of said membrane module and including a communication chamber having spaced through-openings in fluid communication with said communication chamber and the membrane module, wherein, in use, gas is supplied to the communication chamber and communicated to the membrane module through said through-openings to aerate the membranes within the membrane module and liquid backwash is withdrawn from and/or fed into the membrane module through said through-openings into said communication chamber.

14. A porous membrane filtration module according to claim 13 wherein the through-openings are vertically spaced through-openings in fluid communication with said chamber and the membrane module, wherein, in use, gas is supplied to the chamber and communicated to the membrane module through at least the upper of said through-openings to aerate the membranes within the membrane module and liquid backwash is withdrawn from and/or fed into the membrane module through the lower of said through-openings into said chamber.

15. A porous membrane filtration module according to claim 13 or 14 wherein a filtrate connection pipe is provided in fluid communication between the upper and lower filtrate collection chambers and filtrate is withdrawn from one or the other of the collection chambers.

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16. A porous membrane filtration module according to any one of claims 13 to 15 wherein the aeration/backwash device is located adjacent the lower header.

17. A porous membrane filtration module according to any one of claims 13 to 16 wherein the upper and lower collection chambers include respective upper
5 and lower collection cups adapted to detachably receive and engage in a fluid-tight manner said upper and lower headers.

18. A porous membrane filtration module according to claim 17 wherein the headers are lockably engaged with the collection cups by means of a bayonet-type fitting.

10 19. A porous membrane filtration module according to any one of claims 13 to 18 further including a screen which at least partially surrounds said membranes.

20. An porous membrane filtration module according to claim 19 wherein the screen is a sleeve which extends along part of the length of the membranes,

21. A porous membrane filtration module according to claim 19 or 20 wherein
15 the screen is solid.

22. A porous membrane filtration module according to any one of claims 19 to 21 wherein the screen is located above said aeration/backwash device.

23. A porous membrane filtration module according to claim 21 wherein the screen extends along the full length of the membrane module and is provided
20 with one or more openings adjacent the through-openings of the aeration/backwash device to allow communication with the membranes and one or more additional openings at or adjacent the top of the module to allow flow of gas or liquid therethrough.

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24. A porous membrane filtration module according to claim 23 having one or more further openings in said screen at or adjacent the aeration/backwash device to allow bypass of backwash flow.

25. A method of removing contaminant material from a feed liquid using a
5 porous membrane filtration module according to any one of claims 13 to 24 including the steps of

- (f) performing a filtration operation wherein feed containing contaminant matter is applied to one side of the membrane wall and filtrate is withdrawn from the other side of the membrane wall,
- 10 (g) communicating said withdrawn filtrate through at least one of the upper and/or lower headers to at least one of the upper and/or lower collection chambers,
- (h) supplying gas to the communication chamber and communicating said gas to the membrane module through said through-openings to aerate
15 the membranes within the membrane module;
- (i) backwashing said membrane wall using a liquid;
- (j) withdrawing liquid backwash from the membrane module through said through-openings into said communication chamber.

26. A method according to claim 25 wherein the gas and liquid backwash are
20 selectively communicated and withdrawn through the same through-openings.

27. A method according to claim 28 when appended to claim 14 wherein the gas is supplied to the chamber and communicated to the membrane module through the upper of said through-openings to aerate the membranes within the membrane module and liquid backwash is withdrawn from and/or fed into the

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membrane module through at least the lower of said through-openings into said chamber.

28. A method according to claim 25 when appended to claim 14 including feeding the backwash or feed liquid into the base of the module through the
5 lower openings or both set of openings.

29. A method according to claim 25 when appended to claim 14 or claim 28 including using the backwash and/or feed liquid to sweep solids along the membranes to carry out solids removed from the membrane surfaces during said aeration.

10 30. A method according to claim 25 when appended to claim 14 or claim 28 or 29 wherein the membrane module is submerged in feed liquid contained within a vessel and including the step of flushing backwash waste containing the solids from the vessel by overflowing at the top of the vessel.

31. A method according to claim 25 when appended to claim 14 or claim 28 or
15 29 including the step of flushing backwash waste containing the solids from the module by overflowing at the top of the module.

32. A method according to claim 25 when appended to claim 14 or claim 28 or 29 including the step of flushing backwash waste containing the solids from the module by draining or pumping the waste from the module through the
20 openings.

33. A method according to any one of claims 29 to 32 wherein including the step of introducing gas into the module during said flushing step.

34. A method according to claim 33 wherein said gas is mixed with said backwash and/or feed liquid.

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35. A method according to claim 33 wherein said gas is introduced to said communication chamber.